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Association of MAP specific ELISA-responses and productive parameters in 314 Danish dairy farms

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Background

Mycobacterium avium subsp. *paratuberculosis* (MAP) infection may impact productive parameters such as milk yield and reproduction that are central determinants to culling decisions.

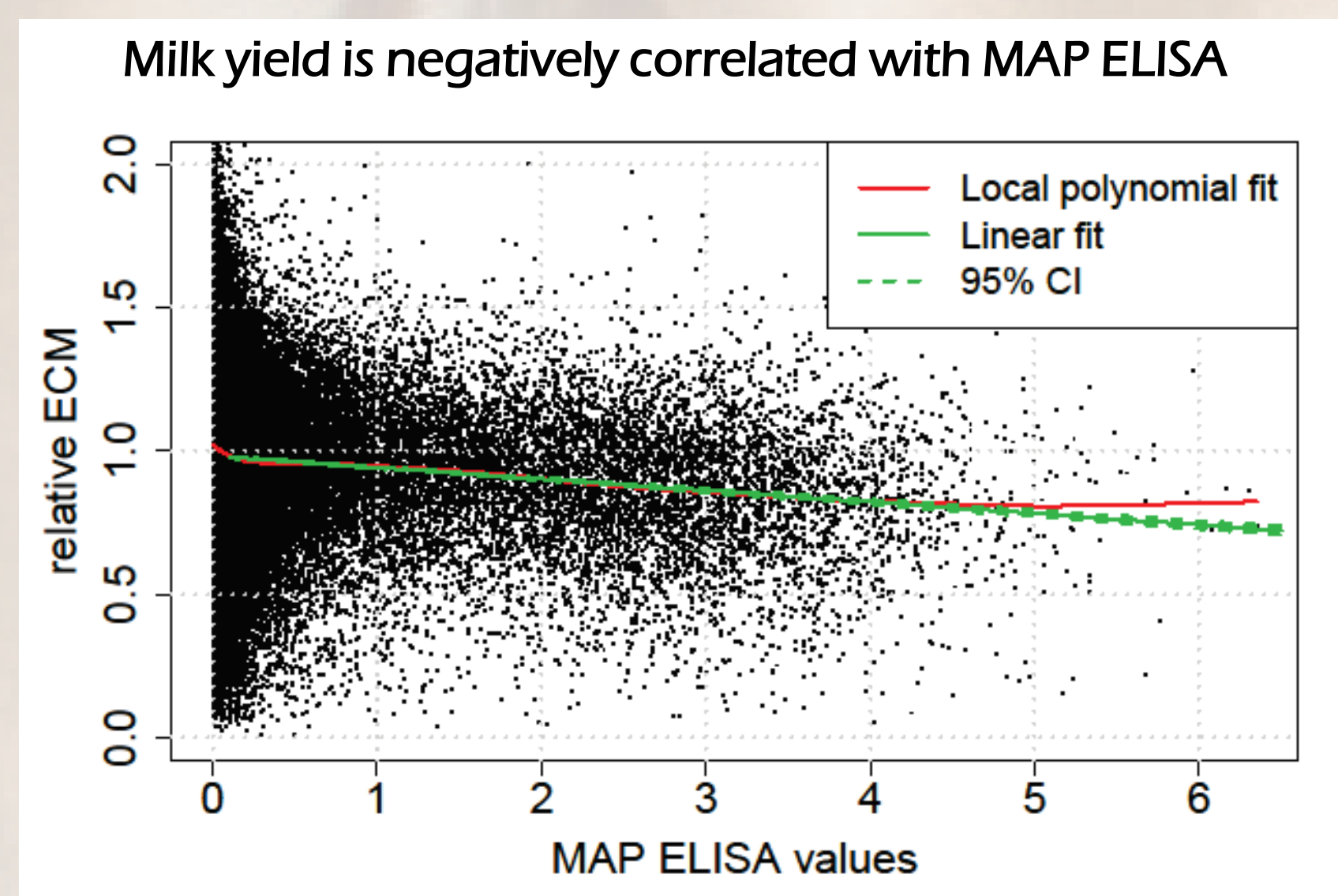
Aim

This study aimed to compare the test-day milk yield and lactation specific conception probability in 94,064 Holstein cows in 314 dairy herds from the Danish control programme on paratuberculosis.

Conclusions

- Milk yield of MAP infected cows was higher prior to testing positive.
- High ELISA S/P values correlated negatively with milk yield.
- MAP infection prior to positive ELISA result does not influence conception negatively

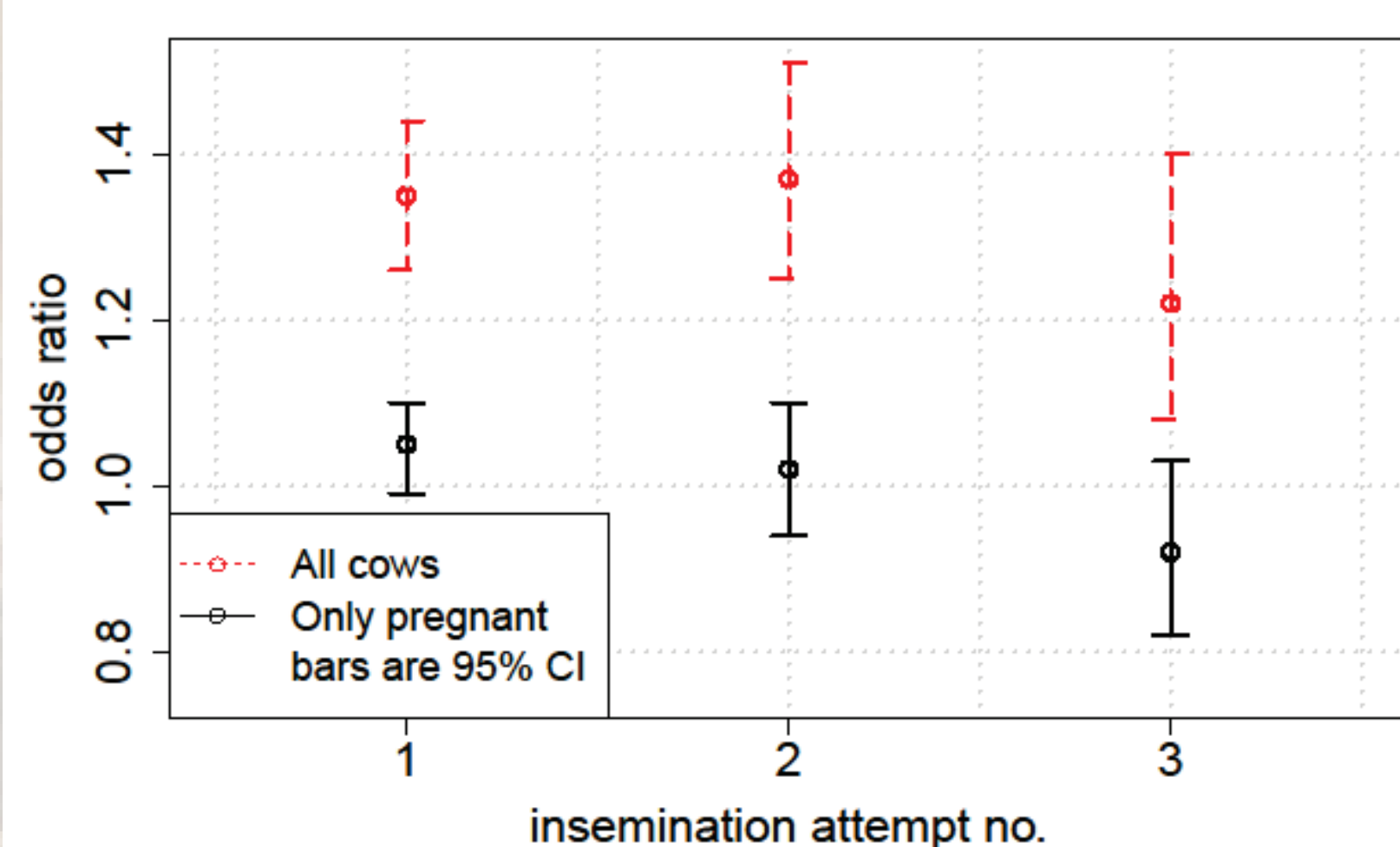
Results



The energy corrected milk yield relative to the average cow on each farm (rECM) as a function of the MAP S/P values. A cow with ELISA = 5 has an expected milk yield loss of 22% compared to the average cow on the same farm.

However, cows that at some point in their life tested MAP positive produced 2.2% (95% CI: 1.7-2.6%) more milk prior to a positive test, compared to cows never testing positive (not shown).

Bias in estimate of odds ratio for conception probability



First parity conception probability for cows later testing MAP ELISA positive relative to cows never testing positive.

The odds ratio using all cows suggest that cows testing MAP positive later in life have a ~30% higher chance of a successful insemination. However, no difference was seen when using only cows that stayed in the herd => bias in the former method, but the latter may also result in healthy-worker survivor bias.

Methods

Wilmink lactation curves were fitted for parity 1, 2, and 3+ for each herd.

These curves represent the expected energy corrected milk yield of the average cow on each farm.

For each milk yield point, the value relative to the average cow on the farm (rECM) was then calculated.

The conception probability was tested in a generalized linear model using the binomial family with a logit link function, with farm and positive/negative ELISA test as fixed effects.

Project iCull is creating a support system to aid farmers in deciding which cows are least profitable and should be culled.

Decisions will be based on all current information on each cow, and simulations of the entire herd.

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